

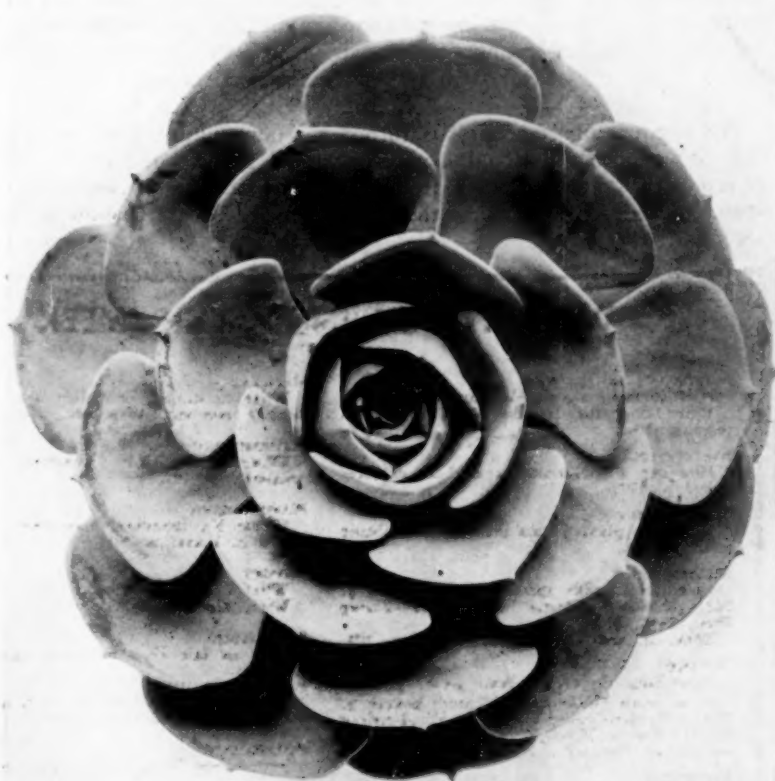
PRICE
5¢

AL. ROOM
GENERAL LIBRARY
UNIV. OF MICH.

SEP 25 1933

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



SEPTEMBER 23, 1933

Victor of the Desert

See Page 201

A

SCIENCE SERVICE PUBLICATION

SCIENCE NEWS LETTER

VOL. XXIV

No. 650

The Weekly  Current
Summary of Science

Published by

SCIENCE SERVICE

The Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Edited by WATSON DAVIS

Subscription rates—\$5.00 a year postpaid; two years, \$7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

In requesting change of address, please give old as well as new address.

Advertising rates furnished on application.

Board of Trustees of Science Service

Honorary President, William E. Ritter, University of California. Representing the American Association for the Advancement of Science, J. McKeen Cattell, President, Editor, Science, Garrison, N. Y.; Burton E. Livingston, Johns Hopkins University, Baltimore, Md.; Raymond Pearl, Director, Institute for Biological Research, Johns Hopkins University, Baltimore, Md. Representing the National Academy of Sciences, W. H. Howell, Vice-President and Chairman of Executive Committee, Johns Hopkins University, Baltimore, Md.; R. A. Millikan, Director, Norman Bridge Laboratory of Physics, California Institute of Technology, Pasadena, Calif.; David White, Senior Geologist, U. S. Geological Survey, Representing National Research Council, Vernon Kellogg, Secretary Emeritus, National Research Council, Washington, D. C.; C. G. Abbot, Secretary, Smithsonian Institution, Washington, D. C.; Harrison E. Howe, Editor of Industrial and Engineering Chemistry, Representing Journalistic Profession, John H. Finley, Associate Editor, New York Times; Mark Sullivan, Writer, Washington, D. C.; Marlen E. Pew, Editor of Editor and Publisher, New York City. Representing E. W. Scripps Estate, Harry L. Smithson, Treasurer, Cincinnati, Ohio; Robert P. Scripps, Scripps Howard Newspapers, West Chester, Ohio; Thomas L. Sidlo, Cleveland, Ohio.

Staff of Science Service

Director, Watson Davis. Staff writers: Frank Thone, Emily C. Davis, Jane Stafford, Marjorie Van de Water, J. W. Young; Librarian, Minna Gill; Sales and Advertising Manager, Hailie Jenkins.

Copyright, 1933, by Science Service, Inc. Reproduction of any portion of the SCIENCE NEWS LETTER is strictly prohibited since it is distributed for personal, school, club or library use only. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service, details and samples of which will gladly be sent on request.

Members of the American Association for the Advancement of Science have the privilege of subscribing to the SCIENCE NEWS LETTER at the reduced price of \$3 per year. Application for this privilege should be accompanied by privilege card obtained from the Permanent Secretary, A. A. A. S., Smithsonian Institution Building, Washington, D. C.

Publication Office, 1930 Clifton Ave., Baltimore, Md., Editorial and Executive Office, Constitution Ave. at 21st St., N. W., Washington, D. C.

Address all communications to Washington, D. C. Cable address: Scienserve, Washington.

Entered as second class matter October 1, 1926, at the post-office at Baltimore Md., under the act of March 3, 1879. Established in mimeographed form March 13, 1922. Title registered as trade-mark, U. S. and Canadian Patent Offices.

DO YOU KNOW?

A new vacuum cleaner has a headlight, to guard against collisions with furniture legs in dark corners.

Eastern brook trout often adventure out to the sea in the summer, and enjoy the abundant food in bays and inlets.

Experiments with animals have shown that a diet deficient in calcium may cause the optic nerve to degenerate and thus lead to blindness.

Turquoise was mined in the Sinai Peninsula by the Egyptians, yet this blue stone is not mentioned in the Bible by any recognizable name.

Archaeologists believe that Tutankhamen's tomb in Egypt was plundered twice, once by robbers hunting gold and once for the valuable unguents stored there.

An engineering company has turned out for a rubber mill a 1,000-horsepower motor that can be brought from full speed to a dead stop in less than two seconds.

A process for extracting oil from soy beans, using alcohol as a solvent, has been perfected in America.

Earrings of Irish gold found in Gaza, Palestine, have been dated at 1500 B.C., showing the early spread of trade in Irish gold.

The latest estimate of deaths due to the World War places military deaths at 13,000,000, and civilian deaths at over 28,000,000.

Production of 1,000,000 tons of sugar annually from wood is projected in a research report to the Swedish Government Forestry Commission.

The phrase "cool as a cucumber" is upheld by temperature tests: a cucumber is usually one degree cooler than the air temperature.

Government food and drug officials find that a good many caustic poisons now on the market are not properly labeled so as to show their dangerous character.

WITH THE SCIENCES THIS WEEK

ASTRONOMY

How common are double stars? p. 200.
When does the Harvest Moon shine this year? p. 204.

BACTERIOLOGY

How can a refrigerator be used as an incubator? p. 197.

BIOCHEMISTRY

Where do plants obtain the vital pantothenic acid? p. 195.

BIOLOGY

How do lungfish spend their summers? p. 202. *Kamongo—Homer W. Smith—Viking Press, 1932, \$2.*
What did tests of sex control reveal? p. 204.

BOTANY

How large do ocean plants grow? p. 205.
How much rubber in goldenrod leaves? p. 200. *Rubber-Content of North American Plants—Harvey M. Hall and Frances L. Long—Carnegie Institution, 1921, \$1.00.*

CHEMISTRY

What is the source of the new chemical treatment for skin diseases? p. 196.

What size moldings can be made from synthetic plastics? p. 196. *Creative Chemistry (rev. ed.)—Edwin E. Slosson—Century, 1930, \$3.50.*

COSMOLOGY

How long did it take for the creation of the universe? p. 201.

ECOLOGY

How do succulents defeat the desert? p. 201. *The Plant in Relation to Water—N. A. Maximov—Macmillan, 1929, \$6.50.*

ELECTRICITY

What, in the past, has prevented the use of electrostatic disks in place of generators? p. 202.

INDUSTRIAL PHYSIOLOGY

What are some of the human aspects of machine designing? p. 200.

MEDICINE

What constituent in pollen spells suffering for hay fever victims? p. 200.

METEOROLOGY

What is the chief "commodity" of the Antarctic? p. 197.

PALEONTOLOGY

Whose big footprints have been found fossilized in Texas? p. 201.

PHYSICS

What does water film contain? p. 203.
What fills "empty" space? p. 205.

PHYSIOLOGY

Why are safe drugs sometimes fatal? p. 205.

PLANT PHYSIOLOGY

Can plants make direct use of fertilizer without previous soil action? p. 202.

PSYCHOLOGY

Are college boys fond of their parents? p. 204.

Are short, fat men likely to stutter? p. 201.
Does your heart react when you hear a pistol shot? p. 206.

How are human errors of service to psychological science? p. 195.

How is the most modern aptitude test conducted? p. 200.

What is one of the great dangers of leisure and short hours? p. 198.

These curiosity-arousing questions show at a glance the wide field of scientific activity from which this week's news comes. Book references in italic type are not sources of information of the article, but are references for further reading. Books cited can be supplied by Book Dept., Science News Letter, at publishers' prices, prepaid in the United States.

BIOCHEMISTRY

Omnipresent "Pantothenic" Acid is Stimulus to Growth

Found in All Plant and Animal Substances, It Speeds Cell Division Ten to Twenty Thousand Fold in Few Hours

ALL LIFE may involve the presence of a powerful growth-stimulating acid which has been found in many different kinds of plants and animals and has been concentrated by Dr. Roger J. Williams and Carl M. Lyman, of Oregon State College, to a potency one thousand times stronger than any previously reached.

Because of the widespread occurrence of this little-known substance Dr. Williams, who reported his latest researches to the American Chemical Society, has tentatively named it "pantothenic" acid from the Greek for "from everywhere." The name is justified by tests which show that pantothenic acid was obtained from all sources examined so far which include: cattle, human and chicken liver, milk, crab eggs, sea urchin eggs, planarian worms, earthworms, oysters, bacteria, molds, yeast, mushrooms, potatoes, apples, grains, algae and soil.

"It is probably safe to say that this acid is more widely distributed in nature than any other physiologically potent substance," Dr. Williams declared. "The evidence shows that it is contained in all living substances from the highest mammalian form down to the lowliest worm and from the highly developed green plant down to the tiniest yeast, mold or bacteria.

"The acid was discovered because of its effect on yeast growth," he continued. "When placed in a solution in which yeast is growing it may increase the rate of multiplication from ten to twenty thousand fold in eighteen hours. The fact that it is apparently present in all living cells suggests that it may act as a growth regulator in all cells. It is interesting to observe that yeast and mushrooms, which proverbially grow rapidly, are comparatively very rich sources of the acid."

As recently concentrated by Dr. Williams and his associate, pantothenic acid is so potent in speeding up the growth of yeast that a quantity much smaller than the head of a pin has a detectable

effect when placed in 250 gallons of solution in which yeast is growing. The presence of one part of the preparation in one billion parts of yeast culture medium is noticed by the resulting growth increase.

"While the origin of this acid in nature is obscure, except for the fact that it is produced by certain molds in soils, for example," Dr. Williams explained, "we are led to suspect that it is one of the unidentified water-soluble vitamins. In fact, several of its properties at first suggested a close relationship to vitamin G; yet unlike the widely known vitamins it appears to be a substance that even plants cannot make for themselves, but must obtain directly from the soil."

Dr. Williams' present work grew out of studies of the many practically unknown substances that stimulate yeast growth and carries on a detailed examination of one of the more simple of these materials. It is the acid constituent, he found, of the previously widely heralded "bios," a hypothetical substance thought necessary to life. Though the chemical formula of pantothenic acid has not been determined, something is known concerning the structure of its molecule. Its molecular weight has been found to be about 150.

Science News Letter, September 23, 1933

PSYCHOLOGY

Consistency Found in Errors of Judgment

ERRORS made by the brain are the clues pursued by one psychologist. Dr. George Kreezer, of the Vineland Training School, in research conducted at Berlin, discovered a certain consistency in errors of perception.

If you see a light of a certain intensity, and again, a few seconds later, see a light of exactly the same intensity, you will probably judge the second light to be brighter than the first.

If you see a light a little to your left

and then another of exactly the same intensity a little to your right, you will judge the left light to be brighter. Some persons—and they may be those with a tendency to lefthandedness—are exceptions and consistently judge the right to be brighter.

If you hear a tone at your left and then another of exactly the same intensity at your right, you will judge the right tone to be louder—you will, that is, if you are one who judged the left light to be brighter. If you are one who sees the right light as brighter, you will hear the left tone as louder.

Thus errors of hearing are consistent with—although opposite to—errors of vision. Yet each type of signal comes to the brain through separate sense organs and over separate networks of the brain's telegraph wires, the nerves.

These perception errors are not due to differences in the sense organs. Neither are they a matter of the nervous pathways to your brain. That has been established. They depend upon the brain itself. They indicate that a certain organization must exist in the brain which in some respects at least conforms to the space-time organization of the material world outside the self, and helps us to account for our perception of that world.

Science News Letter, September 23, 1933



WANTED: WINTER APARTMENT

As autumn advances, many species of spiders abandon their webs, join the ranks of the hunting spiders that never make webs, and seek quiet dark corners where they can hibernate. That is why the distressed housewife often complains of "spiders all over the place" at this time of the year. Cornelia Clarke's camera here gives us a close-up of one of these autumnal house-hunters, a black spider. So good is the enlargement that it is easy to see six of the eight eyes possessed by the lady (most of the male spiders were eaten by their wives, weeks ago), and a little closer examination will disclose the other two.

CHEMISTRY

Chemical Rarities Made Cheap; Find Many Profitable Uses

Improvements in Tanning, Dyeing, Baking, and Other Industries Possible Through Synthesis of Maleic Acid

CHEMICAL curiosities that have recently become useful in scores of jobs from speeding up the aging of wine to protecting life from poison gas, a method of warding off colds and strengthening the body against other ailments, new resins that make textiles non-creasable and are strong enough to be moulded into chairs and window frames: these were among the scores of advances reported before the Chicago meeting of the American Chemical Society.

Describing as "utopian and distinctly American achievements" the working out of processes by which ordinary air is made to combine with benzene and naphthalene to produce cheaply and in abundance maleic acid, a laboratory rarity a short time ago, Dr. Charles R. Downs, chemical engineer of New York City, pictured some of the many uses to which this new industrial substance is already being put.

"It usually requires several years of aging for the precipitation of the excess tartar in wine," Dr. Downs said. "If the wine is bottled before the precipitation of tartrates is completed, it will lose commercial value because some tartrates will precipitate as undesirable. If, however, calcium malate is added to wine, even when young, any proportion of tartaric acid can be removed in a very short time. The acid is also used as a gas mask ingredient for absorbing ammonia vapors."

Versatile Maleic Acid

Maleic acid and related compounds have also been found to prevent the development of rancidity in stored fats and oils, serve successfully as new resins for lacquers and varnishes, aid the dyeing of textiles, replace advantageously acids commonly used in tanning, become a baking powder ingredient, aid the substitution of a chemically known salt for ordinary table salt for those who cannot tolerate table salt, and in the form of little tablets conveniently disinfect small quantities of water for

drinking purposes through the release of free chlorine.

Carotene, the vitamin A carrying yellow coloring matter of carrot, butter, whole milk and other fruits and vegetables, is much more valuable than nutritionists now believe and its use in the diet should be increased, Dr. A. F. O. Germann, of Cleveland, told his fellow-scientists. He said that prehistoric man was able to resist many diseases that afflict civilized men because he ate quantities of this substance.

Citing recent recognized research, Dr. Germann said that "a carotene supplement to the normal diet is the best known preventive of upper respiratory

infections; brings about improvement in vision in human cataract; gives promise of relief in certain allergic conditions such as house dust allergy and hay fever; causes more rapid healing of wounds, and gives promise of greatly improving the general health and well-being."

Dr. Carleton Ellis, of Montclair, N. J., described unusual uses for the newest synthetic resins, the molded products which first replaced celluloid and hard rubber articles but are now finding a much wider field of application. Tanks nine feet in diameter have been made from one new material of the phenol-aldehyde class, he said. It is now possible to mold articles as large as chair backs and legs, table tops and radio cabinets.

Moldings made from urea and formaldehyde, Dr. Ellis continued, are strong, light in color and very resistant to darkening under influence of light. Articles can be made from them in a great variety of bright colors. When textiles impregnated with these resins are heated, the resins set and the cloth becomes non-creasable.

Science News Letter, September 23, 1933

CHEMISTRY

Woman Scientist's Discovery Cures Stubborn Skin Disease

STUBBORN skin infection such as ringworm, often called athlete's foot, and many eczemas should become less dreaded following the discovery of chemicals unusually effective in their treatment, by Cornelia Burwell, young research worker of Ann Arbor, Mich. Miss Burwell, who was graduated from the University of Michigan only three years ago, reported her investigations to some of the country's most prominent medical chemists at the recent Chicago meeting of the American Chemical Society. It was her second appearance before that body.

Complicated organic compounds built up in the laboratory as salts of various fatty acids made from petroleum were first found by laboratory test to bring death to skin fungi. But their effectiveness in actual treatment of disease was even greater than the tests indicated, Miss Burwell stated, probably because they very readily penetrate the skin.

Remarkable results of the treatment of more than one hundred cases of ringworm and a number of eczema and dandruff patients were reported. It was pointed out that the salts do not cure, but merely establish a normal condition in the skin so that it can function properly and heal itself.

Miss Burwell also described a number of cases of the constitutional diseases, acne and psoriasis, in which the troublesome and unsightly skin outbreaks healed, at least temporarily, and with the prospect that they can be kept down by continued treatment.

The report was received with interest by Miss Burwell's older and more experienced fellow-scientists who, from long familiarity with the uncertainties and difficulties of diagnosing and treating skin infections, expressed the hope that the new chemicals meet the severe requirements of medical workers.

Science News Letter, September 23, 1933

METEOROLOGY

Meteorologists Go With Byrd To Study Antarctic Weather

AT THE LITTLE wooden office of the airport weather station in South Washington, Va., a veteran weather man of the first Byrd Antarctic Expedition is making ready to join the Admiral again for a renewed attack on South Polar weather secrets.

While he talks to aviators of such tame matters as ordinary United States weather, William C. Haines is looking ahead to Sept. 25, when he will sail from Boston on Admiral Byrd's ship to study the icy, blizzardy weather of the world's coldest continent.

The whole Antarctic, as big as the United States and Mexico put together, turns out just one commodity that the world takes and uses. That is weather. South America and lands farther from the South Pole get some of their waves of chill, drought, heat, and rain from the busy South Polar weather factory. But the rules of production and distribution that run the factory are almost unknown.

To investigate, to get at some of the reasons, this is the task confronting Mr. Haines and the other meteorological staff member of the expedition, George Grimminger. It is Mr. Grimminger's first venture into the Antarctic. Both men are from the Weather Bureau.

It is expected that one base for observations may be established in the interior, at an advanced position, perhaps not far distant from the Pole. Some of the weather records noted by Mr. Haines on his previous year in the Antarctic may be far eclipsed. His coldest weather record was 72 degrees below zero, and the warmest summer day was just three degrees above freezing. In a mid-winter blizzard, in July, his instruments recorded a drop to 58 below zero and just when the cold was most intense the wind blew 43 miles an hour. And that, Mr. Haines thinks, may be a record for blizzards anywhere.

"We expect to lay stress this year on upper air observations," Mr. Haines said. "We can generalize more accurately about the wind direction and velocity as we find it high in the air. At ground level, weather records are more complicated by influence of local geography."

Winds are especially important in the Antarctic weather, Mr. Haines explained, for winds, even more than icebergs, are carriers of cold there. Swiftly changing temperatures and changes in air density raise the wind, and the wind carries cold across the icy continent and out toward warmer latitudes.

Instruments packed for the expedition's use will include standard equipment, furnished by the U. S. Weather Bureau, for measuring temperature, barometric pressure, wind direction and velocity, and humidity. The clocks have to be adjusted for low temperature, but not much trouble is expected in handling equipment.

The possibility of establishing permanent weather stations in the Antarctic, to keep the world informed and warned of weather brewing there, seems very remote these days, Mr. Haines believes. So expensive is such a proposition that it can only be carried out if leading countries of the world cooperate in the financing. Meanwhile, the data that will be needed are being gathered by the weather explorers, and it is hoped that even without Antarctic weather bureaus the world may profit by greater knowledge of Antarctic weather.

Science News Letter, September 23, 1933

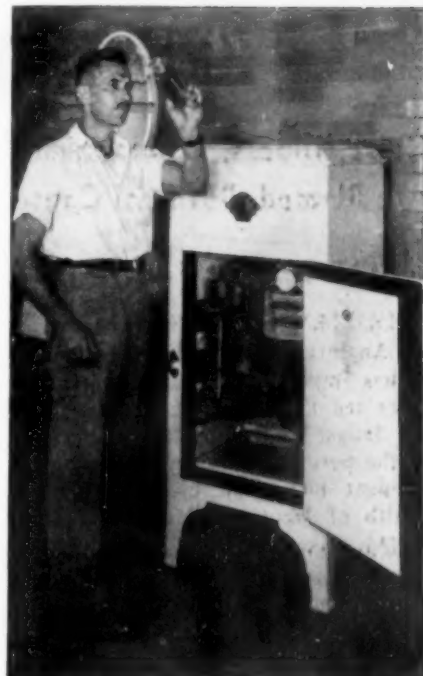
BACTERIOLOGY

Electric Refrigerator Gets New Role as Incubator

ELECTRIC refrigerators are now being successfully used as incubators. This paradox has been reported by Waldo H. Schock, chief operator of the Norwalk, Ohio, sewage treatment plant, where two electric refrigerators have been established. What they incubate, however, is not the conventional "settin' of eggs," but flasks of culture fluids in which bacteria grow.

Instead of reducing the temperature below that at which germs can thrive, as is the case in household refrigerators, these incubator refrigerators raise the temperature to exactly the degree at which certain sewage germs grow.

Ordinary incubators operate at a temperature of 98.6 degrees Fahrenheit, or



WARMED IN A REFRIGERATOR

Reversing the conventional role of the refrigerator, bacteriologists use these electric temperature-control cabinets for the incubation of germs that grow best when they are moderately cool.

body heat, most favorable temperature for the growth of ordinary germs. But the particular germs which Mr. Schock and assistants deal with must be kept for five days at the much lower temperatures of between 66 and 70 degrees. Previously this temperature was maintained, more or less, by equipping the 98.6 incubator with water baths to cool it down. It was hard to keep the temperature steady in this way, however, so electric refrigerators were adopted.

Science News Letter, September 23, 1933

THE INVISIBLE FRONTIER

an address by

Prof. W. T. Thom, Jr.

Department of Geology at Princeton University

To be given Friday, Sept. 29, at 2:45 p. m. Eastern Standard Time over stations of the Columbia Broadcasting System. Each week a prominent scientist speaks over the Columbia System under the auspices of Science Service.



PSYCHOLOGY

"Nerves" Take Toll in Mishaps

Noise, Illness, Communism, and Rush of Machine Age Are Blamed, But Real Cause Lies in Unhealthy Leisure

By MARJORIE VAN de WATER

INDUSTRY has an invisible enemy.

An intangible, insidious, but nevertheless important foe helps to post up those red figures on the wrong side of the ledger by cutting down efficiency in the personnel, and by increasing the accident rate, even by sacrificing the health of laborer and executive alike.

This unseen thrower of monkey-wrenches into the human machinery of business has been recognized by a British scientist, Dr. Major Greenwood, professor of epidemiology and vital statistics at the University of London, as that vague something that the layman calls "nerves."

Any schoolboy knows what is meant by this term, and he knows that it does not refer to the physiological mechanisms that serve to carry messages from the sense organs of sight, hearing, touch, and so on, to the brain. Those are nerves, but not "nerves." He may not be able to give you a definition, but he knows quite well what is meant when his mother says, "Johnny, stop blowing on that horn, it gets on my nerves!"

"My nerves can't stand the least bit of excitement."

"I never can do my best on an examination—it's my nerves."

"Edna can't stay alone at night, her nerves are so bad."

A Fourth are Nervous

Such expressions are perfectly familiar to everyone. And the symptoms that the term represents are common, too, Dr. Greenwood found. Many more than a fourth of those actually doing the work of the world in factories, offices, and government departments have "nervous" symptoms.

Dr. Greenwood was led into the appraisal of "nerves" in industry first through a study of the trivial accidents which cause so much waste of time and material.

Accidents do not just happen, he discovered.

If industrial accidents were pure ac-

cidents, they would be just as likely to happen to one person as another. They would be distributed by chance like the numbers in a lottery or like the numbers in repeated throws of unloaded dice. If on one day an individual had had an accident, that individual would be no more and no less likely to have another accident the next day than any other worker. Or, to use the language of insurance men, no one person would be a better or worse accident risk than another.

Not Distributed by Chance

Industrial accidents are not thus impartially distributed, however. Here is what Dr. Greenwood discovered about the actual distribution of these mishaps. Only trivial accidents that would not take the worker away from his task were considered, because, of course, if he left the job he would not be exposed to the chance of accident any more for the time being.

Of 648 women munition workers—Dr. Greenwood was attached to the British Ministry of Munitions—447 had no accidents at all during the period of five weeks studied. This number is much higher than would be accident-free if the accidents were distributed by chance. On the other hand, twenty-one of these women had three accidents each although by chance you would not expect more than seven to be so "unlucky." And three of the women had four accidents each; two had as many as five. These high scores would not be attained by more than one individual in a chance distribution.

Similarly, the accidents of machinists over periods of three and six months were most unevenly distributed. Of 414 watched for three months, 296 were accident free. But at the other end of the scale one man had eight accidents, another had six and four had five. In a chance distribution of the total number of accidents occurring, no one person would have more than four, but only 256 would be entirely without mishap.

"There is an even simpler way of demonstrating that variations of personal liability are of great importance,"

Dr. Greenwood said in a report of his study to the scientific journal, *Human Biology*. "If the cards are fairly dealt, there should be no correlation between the number of trumps I hold on Monday evening and the number of trumps I hold on Tuesday evening. If accidents are random happenings, my score in one month's work ought not to be correlated with my score in another month's work. Actually there is quite a substantial correlation between the accident scores of different periods."

So the little jinx who causes accidents is not a blind goddess who is likely to attach herself to anyone. Rather she follows the footsteps of those who for some reason attract her. The mysterious attraction is "nerves," Dr. Greenwood concludes.

Psychological tests which can be used to sort out the emotionally unstable from a group of persons tested can also be used to discover those who will have a high accident rate.

The employer cannot eliminate accidents in industry simply by clearing up this situation of "nerves" among his workers, Dr. Greenwood shows, however. The reason for this is quite simple, if not immediately obvious and lies in the fact that, as Dr. Greenwood says:

"The 'nerves' of employers are rather more important than the 'nerves' of employees."

Lost Time

Therefore the plant having the greatest incidence of "nerves" among employees is not necessarily the plant in which the greatest amount of time is lost through illness, even illness certainly referable to "nerves."

What is the reason that "nerves" have become so important in our modern industrial civilization? The cause assigned by Dr. Greenwood is rather striking and most unusual. He does not join with those who denounce the bustle and noise of the city, the hurrying thousands in the rushing subway trains, the mania for speed in the modern powerful automobile, or the artificial drive placed upon workers who must keep pace with rapidly moving industrial machinery.

"In this age of the world, 'nerves' are more important than in the age of William the Conqueror not because the pace of life is faster than in 1066 but

for the precisely opposite reason. It is so much slower. Life in old England may have been merrier but it was certainly shorter than it is now, the struggle for bare existence keener. Hunger, according to a mediaeval saying, was the Englishman's plague.

"There is nearly always some truth in popular harshness and folly; the sneer of the tough-minded at the troubles of the tender-minded, whether called vapours, hysteria, or 'nerves,' to the effect that only idle people have time to indulge their 'nerves' has a percentage of truth. 'Depend upon it, Sir, when a man knows he is to be hanged in a fortnight it concentrates his mind wonderfully' is Johnson's presentation of the same common sense philosophy.

Too Busy to Brood

"When a man is struggling for his life in deep water, he is either too busy to entertain the haunting thoughts which led one of the subjects of the Board's investigation to dissect her actions and then 'dissect the dissection—till I nearly go mad,' or he just drowns. Where the commonsense philosophy lets us down is in not enabling us to forecast which event will happen. But, statistically speaking, it does not matter; the water test would much reduce the incidence of 'nerves' upon a living population and it was applied in the past.

"Now we do not apply this test. Hardly any people in this country [England] speaking statistically, are in imminent peril of actual starvation, but a great many millions of people in this country have only too much time to dissect the dissections of their feelings. Not only those on the dole, but those at work for which they are ill-fitted but which is the only work available. . .

"Millions of people now have leisure for reflexion. They may not be acutely hungry, they are not in imminent peril of death, but they are insecure.

"Every Englishman over 40 remembers the war-time atmosphere of living in a draughty railway waiting room, waiting for the next train, not knowing when the next train would come. One had plenty of time to stare at and be irritated by the ugly advertisements, to curse the noise of other people's trains, to poke the fire without raising a glow from it, but not time to settle down to read comfortably. We fancied peace would dissipate that atmosphere; it has generalized it. A very large minority of the whole nation are sitting in that waiting room; the time may come when



ONE OF THE WORLD'S NOISIEST SPOTS

Remote from the clangor of cities and the din of steel mills, Niagara has more than its quota of noise, even in the dead of winter. The men in the foreground are estimating with an electrical instrument just how noisy the great cataract really is.

it is a majority. These people are turned in upon themselves; like the proverbial yokel, they sit and think or sometimes they just sit.

Not Trained for Leisure

"They have leisure, but they have not been taught to use that leisure. Uneducated townfolk cannot amuse themselves, and the amusements provided for them, especially those provided by cinema corporations, are remarkable. . . . 'Passionate' scenes at the 'pictures' are rigorously censored, the details of divorce court must not be printed. But the world and its adolescent children may see realistic pictures of men burning to death in aeroplanes or being shot by files of soldiers."

What Dr. Greenwood says of conditions of idleness and enforced leisure in England is true in very nearly the same degree of conditions here.

Even among the employed, very few are working under pressure all their waking hours. Practically every one has a great many hours for his own devices.

Plenty of time here, too, for "dissecting the dissection." There is a real need for most of us to learn to find interest and occupations for these peri-

ods of enforced leisure, as well as for the welcomed leisure that comes along with the shortened work day and abbreviated work week. Educators suggest that with the aid of the public library and free extension courses in connection with the public schools that even such times which Dr. Greenwood likens to train-waiting may be turned to profit. Others point to the value of sports and hobbies and such simple, fascinating skills as wood-carving and weaving.

"The seed of 'nerves' is planted in most of us," Dr. Greenwood warns. "We water it with an unhealthy leisure and manure it with bizarre excitants and, when the crop is raised, denounce pneumatic drills, motor-hooters, communist Sunday Schools, psycho-analysts, everything and everybody but the right reason."

Science News Letter, September 23, 1933

Antwerp, Belgium, is getting ready to celebrate the completion of two tunnels under the River Scheldt, one for pedestrians and one for vehicles, which will at last enable the city to spread to the left bank of the river.

BOTANY

Goldenrod Rubber Found Only in Leaves

GOLDENROD rubber is found only in leaves. Stems and roots of all species of goldenrod contain none of it. Hence, if this country is ever compelled to resort to native plants as sources of rubber, goldenrods with plenty of leaves and relatively little stems would be the kinds to cultivate.

These are among the findings of Loren G. Polhamus of the U. S. Department of Agriculture, based on analyses of 24 species of goldenrod. His results are published in the *Journal of Agricultural Research*.

The desirable goldenrod should not only have plenty of leaves, but a high rubber content in the leaf tissue. Mr. Polhamus says. There is a great variability in rubber content among species, and even within a single species different samples will show differences of a hundred per cent. or more.

The highest individual score was made by the leaves of a goldenrod species known botanically as *Solidago altissima*. The best sample showed 6.34 per cent. of rubber in its dried leaves, and all samples of this species have a mean of 3.45 per cent. This particular kind of goldenrod is very widely distributed, occurring from New England through Michigan to Kansas and in most states south of this line.

Science News Letter, September 23, 1933

INDUSTRIAL PHYSIOLOGY

Machines To Fit Men Urged for Better Results

DO NOT FORCE the workman who runs your machine to stoop and peer and assume unnatural positions at his work. Design the machine to fit the man, make his work easier and more natural, and it will pay better dividends, both economically and socially.

So advised Dr. G. H. Miles, director of the National Institute of Industrial Psychology, speaking before the Leicester meeting of the British Association for the Advancement of Science.

Dr. Miles summarized the limitations now imposed on much industrial machinery under six heads:

"Fatigue, which may be caused by: badly arranged controls or working positions; unduly heavy muscular effort; harmful posture, etc.

"Rhythm of machine operations which do not fit in with rhythm of worker.

"Working or observation points being badly placed.

"Attention being distracted by moving parts.

"Attention being distributed in cases where concentration is essential to efficiency.

"Frustration of effort owing to bad design, in setting up, stripping and clearing machines."

There is a penalty exacted by the machines themselves if they are badly designed with relation to their human attendants. Dr. Miles pointed it out in his conclusion:

"Human effort can and does overcome many of the defects of machine design, but at a great loss of efficiency. The quality of work often suffers, and the wholly unnecessary strain is detrimental to human well-being. For the highest efficiency the machines should be designed to fit the human being. In cases where there are insuperable mechanical or process limitations, the workers should be specially selected to suit the peculiarities of the machine or process."

Science News Letter, September 23, 1933

PSYCHOLOGY

Students "Think Out Loud" In New Type of Examination

A NOVEL type of examination in which the subject is not required to write anything, or even to give direct answers to questions, was described to the meeting of the American Psychological Association by Ralph K. White of the University of Chicago.

In this type of quiz, which students are reported to find very enjoyable, the individual is presented with a problem he has selected as seeming interesting and is requested just to think aloud. These musings are taken down in shorthand. This record serves as a fairly reliable index to his aptitude for certain types of intellectual work, Mr. White has found.

The problems selected are matters of dispute among scientists—theories decidedly open to argument on either side. The person examined is not expected to settle the question: he is rated on the type of reasoning he displays.

Science News Letter, September 23, 1933

IN SCIENCE

MEDICINE

Pollen Proteins Cause of Hay Fever

BLAME for hay fever may be pinned on the proteins in the sneeze-producing pollens, rather than on their sugary or starch constituents. This was indicated by a paper presented before the meeting of the American Chemical Society in Chicago by Dr. Marjorie B. Moore of the Abbott Laboratories and Dr. Leon Unger of Northwestern University Medical School.

There has been some division of opinion in scientific circles over the ultimate cause of hay fever. Some investigators have held that it is due to pollen proteins, while others have been of the opinion that certain sugar- or starch-like bodies, called polysaccharides, are to blame.

Drs. Moore and Unger exposed hay-fever-causing pollens to the action of pepsin, which digested away most of the protein in them, leaving the polysaccharides unchanged. The pollens thus treated lost much of their mischief-raising power.

The case against the pollen proteins is thereby strengthened and the polysaccharides exonerated of the suspicions which had been raised against them.

Science News Letter, September 23, 1933

ASTRONOMY

Fourth of Stars May Be Doubles

ONE STAR in every four may be a double, with two suns swinging about a common center of gravity between them. Older estimates, which set the ratio of double stars at one in eighteen, have received a new shaking by the discovery of 2,350 hitherto unknown doubles in the southern sky, during a five-year survey by University of Michigan astronomers working at the Lamont-Hussey Observatory at Bloemfontein, South Africa, under the leadership of Dr. R. A. Rossiter. Dr. Rossiter's results have just been published by the Royal Astronomical Society.

Science News Letter, September 23, 1933

EN FIELDS

PALEONTOLOGY

Huge Dinosaur Footprints Found Along Texas Creek

SOMETHING with feet even bigger than Primo Carnera's ambled along the wet shore of a river or lake in what is now Texas, somewhat over a hundred million years ago, and left footprints that were subsequently buried and hardened into stone. There were, in fact, three of these Somethings, presumably dinosaurs, for three different sizes of tracks were discovered along about 200 feet of the rocky bottom of Hondo Creek by Claud Mangum, an employee of the Humble Pipe Line Company, near where the pipe line crosses the creek.

All the tracks are three-toed. The biggest of them measures 16 inches wide, from toe-tip to toe-tip, and is 16 inches long, from the tip of the middle toe to the heel. There is a second set of tracks 14 by 14 inches, and a third only 10 by 10. The longest pace measures six feet, the shortest four feet. The depth of the prints varies from one to five inches.

A brief description of the Hondo Creek fossil footprints, with photographs, has been sent to the *Journal of Geology* by Sam H. Houston, Jr., of Houston, Texas, and will be published in the forthcoming issue.

Science News Letter, September 23, 1933

ECOLOGY

Leafy Succulents Solve Problem Set by Desert

See Front Cover

DESERT plants have a particularly hard problem to solve, set by that old Sphinx, the desert itself, and if they fail to solve it the penalty is the same as that exacted in the old Greek myth—they must die. They must spread a sufficient chlorophyll surface to the sun to enable the indispensable food-making processes to go on; yet they must deny the imperious demands of that water-greedy fiend, the dry desert wind. They must store enough of food and water to tide them over the

droughty periods, and enable them to go through the energy-taking process of flower-formation and seed-bearing.

Leafy succulents of the crassula family have found one quite successful answer to this exacting problem. They spread their leaves in a low, compact rosette right at the surface of the soil or rock on which they grow. By filling up every chink in the circle thus marked out, they waste no scrap of sunlight. At the same time, by keeping close to the ground, they avoid much of the thirsty wind's attack. Their leaves, moreover, are severely economical in outline, with no lobes or incisions which would increase the evaporating surface. The whole plant is protected within a thick cuticle and covered with a waxy bloom—armor against water loss. The leaves are thickened, and within them the reserve of water and foodstuffs is stored against the season of need. All round, these little plants must be counted as having met and mastered the challenge of the desert.

Science News Letter, September 23, 1933

PSYCHOLOGY

Stutterers Likely to Be Tall, Flat-Chested Men

STUTTERERS are nearly all of the tall, thin, flat-chested build known to psychiatrists as the asthenic type, it appears from a study of the bodily form of stutterers reported.

Forty-one stuttering men, ranging in age from 15 to 30, were given anthropological measurements and personality evaluations at the University of Iowa by Dr. Lee Edward Travis and two associates. A surprising proportion, 75.6 per cent., were found to be of the tall, thin build. Less than 10 per cent. were of the athletic type, that is, tall with broad shoulders, full chest and prominent muscles. Not one was of the short, fat, broad-faced type known as the pyknic build. A large proportion were of a self-centered introverted personality.

But this does not mean that the person's build determines whether or not he will stutter, the investigators point out. Rather they conclude that the stuttering, the physical type, and the personality type are all constitutionally determined. The reason that all persons of the asthenic build do not develop a stutter is because other contributing hereditary and environmental factors are not present in all such individuals.

Science News Letter, September 23, 1933

COSMOLOGY

Universe Described As Born Literally In Single Flash

VISIONING the universe, with all its uncountable stars and galaxies of stars, as born literally in a flash, Abbé Georges Lemaitre, brilliant young mathematical physicist of Louvain University, suggested a high rate of cosmic evolution during its first stages of development, with a later slowing down of the rate as the galaxies formed themselves. "An astronomic instant" was the Abbé's phrase. He spoke at a symposium on the expanding universe at the recent meeting of the British Association for the Advancement of Science.

Prof. Willem de Sitter of the University of Leiden, whose cosmic theory Abbé Lemaitre reconciled with that of Einstein, sees the universe as capable of contraction as cataclysmically rapid as is its present apparent rate of expansion. But he advanced mathematical reasons for not believing that it will vanish, whirlpool fashion, into the single astronomical point in space and instant in time whence it was born.

Sir Arthur Eddington, noted Cambridge physicist and author, gave a new estimate of the cosmic rate of expansion, based on the "uncertainty principle" of Heisenberg. The galaxies, he said, are scattering apart at a rate which doubles their distance from us and from each other in about 1,300,000,000 years.

Science News Letter, September 23, 1933

PSYCHOLOGY

Work Is Easier In Morning Hours

IS THERE a daily rhythm in work efficiency? A new approach to this question was reported to the American Psychological Association.

It is useless to measure work output at different hours of the day, unless some measure is also made of the amount of energy put into the task, Dr. G. L. Freeman of Northwestern University reported. This he has attempted to do by requiring subjects to do the same amount of work at different hours of the day and measuring the energy expended.

It is least in the morning and rises to a maximum in the late afternoon. The energy used during rest, however, was greatest in the early morning and least right after lunch.

Science News Letter, September 23, 1933

ELECTRICITY

Disks Spinning in Vacuum May Replace Present Generators

Young American Physicist Tells British Colleagues Of Plans for High Voltage Electrostatic Machines

ENORMOUS disks, spinning at high speed in an almost perfect vacuum, will replace the familiar generators and motors of modern electrical plants. Thus Dr. R. J. Van de Graaff, brilliant young physicist of the Massachusetts Institute of Technology, prophesied before the meeting of the British Association for the Advancement of Science at Leicester.

These disks would be great electrostatic machines, producing direct current electricity at tremendously high voltage. The vacuum would be necessary in order to prevent the production of tremendous sparks that might wreck the whole machine and would in any case prevent the electricity from being led out on wires to be usefully employed. Dr. Van de Graaff believes that vacua sufficiently high to insulate the machines against such electrical breakdown can be produced, even in the large housings that would be required for the industrial production of current by electrostatic machines. He exhibited designs for such machinery.

If Dr. Van de Graaff's prophecy is realized, it will be, in a sense, progress made by setting the clock back. For the electrical machines that were used by the eighteenth-century school of "natural philosophers," of which our own Dr. Benjamin Franklin was a brilliant member, were all of the electrostatic type. They generated electricity by friction on large disks. Instruments of the same kind are still used for special purposes in laboratories.

The trouble with such machines has always been that the air was not a sufficient insulator to prevent sparks, after a certain potential had been built up. For this reason the development of the electric age had to await the discovery that electricity could be generated in another way, by the moving of a conductor in the field of a magnet. All our present generators are elaborate arrangements of magnets, past which systems of wire coils are rapidly moved, with arrangements for capturing and leading off the current thus produced. They are

the best we have; but their working efficiency is admittedly not as high as could be attained, at least in theory, by properly arranged and insulated electrostatic machines. Dr. Van de Graaff believes that such theoretically possible machines can actually be built.

Dr. Van de Graaff has attracted much attention among physicists by the simple but tremendously powerful electrostatic machines he has already built, first at Princeton and latterly at the Massachusetts Institute of Technology. These have produced "artificial lightning" measured in hundreds of thousands of volts, used in atom-smashing experiments.

Science News Letter, September 23, 1933

BIOLOGY

Father Supplies Young Lungfish With Oxygen

UNIQUE among all known animals is one function performed by the male lungfish of South America, known to zoologists as *Lepidosiren*. He supplies his offspring with oxygen to breathe, much as mammalian mothers give them milk to drink. At the meeting of the British Association for the Advancement of Science, J. T. Cunningham, veteran zoologist, told how it is done.

Lepidosiren belongs to that strange group of fishes that breathe at least part of the time with a primitive kind of lung, and during the dry season burrow into the mud of their shallow lakes or swamps, there to live through the hard times on their accumulated fat.

During this rest period, Mr. Cunningham stated, the eggs are laid and the young hatch. The little lungfish are equipped with external gills, like tadpoles. But there is no oxygen in the muddy water at the bottom of the burrow. How do the young fish get anything to breathe?

The answer seems to lie in some peculiar string-like growths that grow on

the pelvic limbs of the male fish. These are filled with blood vessels; and in an experiment Mr. Cunningham found that oxygen came out of them when the water was lacking in that necessary element.

The male fish remain in the burrow with their offspring; and Mr. Cunningham considers that "it must be concluded that the respiration, and therefore the life of the eggs and the larvae, depend on the oxygen given off by the filaments of the male parent. This is the first case in which evidence has been obtained of the emission of oxygen to the external medium as the normal function of special organs in any animal."

Science News Letter, September 23, 1933

PLANT PHYSIOLOGY

Plants Apparently Use Complex Nitrogen Forms

GREEN PLANTS apparently are able to make direct use of complex organic compounds containing nitrogen, without waiting for them to be reduced to nitrates. Evidence to this effect, which is diametrically opposed to present orthodoxy in plant physiology, has been obtained by Prof. A. I. Virtanen of the University of Helsingfors.

Ever since the days of the great pioneer German chemist, Justus von Liebig, it has been held that higher plants cannot make direct use of the complex nitrogenous compounds contained in such organic fertilizers as common manure, bone meal and cottonseed cake, but must wait for soil bacteria and other microorganisms to convert these into ammonia and then into nitrates.

Prof. Virtanen, however, has succeeded in growing plants in a soil composed of sterile quartz sand, their only possible source of nitrogen being complex organic compounds extracted from the roots of plants of the pea and clover family, or from a water extract of a low moorland soil that contained no ammonia or nitrates.

If Prof. Virtanen's results are proved correct for other nitrogen-containing organic compounds, the eventual effect may be a complete revolution in farm fertilizer practice and hence in the commercial fertilizer industry.

Science News Letter, September 23, 1933

The national president of the Audubon Societies says that song birds are probably more numerous in America now than when the Pilgrims landed.

PHYSICS

Electric "Feelers" Probe Films Ten-Millionth Inch Thick

Characteristics of Organic Materials Much Too Small For Viewing Through Microscope Explored by New Method

SEEKING from the infinitesimal building blocks of matter themselves the secret of why atoms and molecules cling together, to compose the living and lifeless substances of the world, Dr. William D. Harkins and E. K. Fischer of the University of Chicago reported to the American Chemical Society that they are now able to reveal the presence of thin layers of organic material 500 times too small to be seen through the most powerful microscope.

Though we can not see them, such films are on all surfaces, Dr. Harkins explained, and knowledge of them will lead to a better understanding of why all things hold together. He pointed

out that since the human body is made up largely of surfaces in contact with surfaces, this research may eventually explain body processes now little understood.

Films of water have been studied. Such films, only one ten-millionth of an inch in thickness, Dr. Harkins declared, are divided up into islands and continents, and the study of the geography of the surface of almost any body of water reveals an interesting topography. The continents and islands, too small to be seen, are located by measuring with very delicate and sensitive instruments changes in electrical potential caused by the film.

Dr. Harkins has found that the outer part or top of an organic film is, in general, electrically positive with respect to the underlying liquid. Although the change of potential, usually about three-tenths of a volt, seems small, he said, such potentials are related to important features of the surface. Paradoxically, films composed of extremely large molecules, with weights of about 17,000, set up the same potentials caused by films of smaller molecules. What is even more strange, very large molecules gave much thinner films than those made up of molecules sixty times smaller.

Science News Letter, September 23, 1933

ASTRONOMY

Saturday, Sept. 23, Sees Beginning of Autumn

AT 7:01 A. M., eastern standard time, Saturday, Sept. 23, the summer of 1933 came to an end, and autumn commenced. Then, according to computations made in the Nautical Almanac Office of the U. S. Naval Observatory, the sun, which is now moving southwards in the sky among the stars, crossed the equator.

This event is called the autumnal equinox. At this time of year the sun rises directly east and sets directly west, so that it is above the horizon as long as it is below. After the twenty-third, the days will continue to shorten, and the nights to lengthen, until the winter solstice on Dec. 22, when the sun reaches its farthest south position, and winter commences.

Science News Letter, September 23, 1933

New York, Nebraska, and Pennsylvania have enacted laws providing for use of non-shatterable glass in all motor vehicles after designated dates.

HORTICULTURE

New Fig Variety Ripens After Picking

A NEW variety of fig that may be picked green and sent on its way to distant markets while it ripens, like most other fruits, is being developed at the Texas Agricultural Experiment Station, Angleton, Texas, under the supervision of R. H. Stansel. Heretofore no variety of fig has been known that would not sour within one or two days after ripening or that would ripen if picked green. This new fig, if perfected, will greatly expand the fresh fig market.

Figs of this new variety turn purplish brown about ten days before they ripen and will continue to ripen if picked thereafter. The single tree that Mr. Stansel has requires so long a growing season that frost catches the crop in most fig-growing areas.

As one of the steps in further experimentation, Mr. Stansel plans to grow some trees of this variety in the Rio Grande valley, where the growing season will be long enough to allow the entire crop to mature. There are two possibilities. One is to grow the fig entirely

in the winter garden areas. The other is to produce a fig that will retain the characteristics of this variety and yet ripen in a shorter season. Shortening the growing season is the more desirable, since it will allow the growers to get their fresh figs on the market earlier.

Science News Letter, September 23, 1933

CONVENIENCE COUPON

for New or Renewal Subscription to Science News Letter

Send this coupon to Washington while you are thinking of it.

Science News Letter,
21st and Constitution Avenue,
Washington, D. C.

Please ☐ start ☐ renew my subscription to SCIENCE NEWS LETTER. I am enclosing remittance as checked: ☐ 2 years, \$7 ☐ 1 year, \$5

Name
Street
Address
City and
State

If this subscription is a renewal, check here . . .

BIOLOGY

Sex Control Method Fails In Test on Farm Animals

SEX CONTROL of unborn offspring by chemical injection, widely hailed a few months ago after the International Eugenics Congress held in New York, failed to work when tried on swine at the Wisconsin Agricultural Experiment Station, Madison, Wis. Prof. L. J. Cole and Dr. Ivar Johansson, of the genetics department of the University of Wisconsin, treated 32 brood sows with sodium bicarbonate solution before they were bred, in the manner prescribed by the advocates of the "sex control" method. Another group of sows was left untreated, as a check or "control" on the experiment.

When the litters of pigs were born, it was found that the relative numbers of males and females among them were the same in both groups. This would seem to indicate that the treatment had no effect. The experimenters add the comment, however, that the number of animals treated was relatively small, so that to that extent the negative result is not absolutely conclusive. Their re-

port is given in detail in the current issue of *The Journal of Heredity*.

The method tested in the experiment of Prof. Cole and Dr. Johansson was originated by a German physician, Dr. F. Unterberger of Königsberg. It is based on the belief that an acid condition of the fluids surrounding the germ cells at the time of conception favors the production of female offspring, while an alkaline condition favors the birth of males. To give his clients their wish that the baby might be a boy, Dr. Unterberger prescribed a procedure of internal washing with a weak solution of sodium bicarbonate; and he has published claims that his method has been uniformly successful. The Unterberger method received wide publicity when its use and claimed success were described before the Eugenics Congress by a Dutch scientist, Dr. J. Sanders. The negatively resulting experiments of Drs. Cole and Johansson constituted the first actual test of the method made in this country.

Science News Letter, September 23, 1933

PSYCHOLOGY

Tests Reveal Students' Attitude Toward Parents

METHODS for measuring the attitudes of children toward their parents were discussed by Dr. Ross Stagner, University of Wisconsin psychologist, in a recent communication to the American Association for the Advancement of Science.

The methods described involved the use of short statements about the father or mother, expressing widely different degrees of affection, such as "I feel an intense dislike for my father" or "My father and I get along very well." University students were asked to check the statements which showed how they felt about their parents, and scores were computed on the basis of the answers.

Among the facts reported by Dr. Stagner was a difference found when the same statement was made about both

mother and father. As a rule, the judges thought the "unfavorable" statements were much more unfavorable when made about one's mother. For instance, "My father frequently annoys me" was judged to be only slightly unfavorable; but "my mother frequently annoys me" was judged to be very unfavorable.

Dr. Stagner concluded from this that children have been taught to be much more careful of what they say about their mother, and that mothers have been idealized more than fathers. Girls showed this tendency more than boys.

When the scales made in this manner were given to college freshmen, it was found that boys were slightly more favorable toward both their parents than were girls. The results of the scales agreed closely with other measures of

the way these students felt about their parents.

Dr. Stagner, when asked whether his data supported the Freudian theory that boys are likely to be attracted more to their mothers, and girls to their fathers, answered that some of the facts seemed to support this theory, but that there were many exceptions. He promised further facts on this point in a later report.

Science News Letter, September 23, 1933

ASTRONOMY

"Harvest Moon" to be Seen Early in October

THE HARVEST MOON, which traditionally aids the farmer by giving him nocturnal illumination at the time he needs it most, will be seen soon. It is the full moon nearest to the autumnal equinox, an event which occurs on September 23.

On Tuesday, October 3, the moon will be full, rising in the east at the same time that the sun is setting in the west. But if you watch it for several evenings before and after this date, you will find that it rises almost as early each night, as on the previous one. On Wednesday it will rise only about 20 minutes later than on Tuesday, instead of an hour or more later, as when the moon is full at other times of year. Thus, moonlit evenings will remain for a longer time after full than in spring, for instance.

The cause of the harvest moon is found in the fact that at this time of year the moon's path, called the ecliptic, is most nearly parallel to the horizon in the evening hours. The moon is moving along this path now as rapidly as at other times of year, but because of the low inclination of the ecliptic, this motion is more effective in shifting it to the south than in getting it farther below the horizon. In the spring, when the ecliptic is nearly perpendicular to the horizon, this motion is most effective in bringing the moon farther below the horizon, resulting in a greater retardation in the daily time of rising.

Science News Letter, September 23, 1933

A black mallard duck at Fish Point, Michigan, recently was discovered leading a double life; as she had two nests within a few feet of each other which she alternately kept warm, hatching 11 ducklings in one and three in the other.

PHYSIOLOGY

Individual Reactions to Some Drugs Analogous to Hay Fever

WHY ONE person may suddenly die after a single dose of a headache remedy that thousands use without ill effect was explained in terms of chemical reactions at the Chicago meeting of the American Chemical Society. Measures by which chemists might help to prevent such unfortunate accidents were also suggested by Dr. Armand J. Quick of the Fifth Avenue Hospital, New York City.

The unfortunate victims of such accidents have what is called an idiosyncrasy to the drug in question. They are hypersensitive to it just as hay fever patients are hypersensitive to certain plant pollens.

"Only recently has the serious significance of this drug hypersensitivity won recognition," Dr. Quick pointed out.

"Thus, a drug like cinchophen, which has been widely used in the treatment of gout, rheumatism, and neuralgia, has been found responsible for numerous cases of severe liver damage known as acute yellow atrophy. Moreover, cinchophen and related substances and even aspirin, have produced in certain sensitive individuals symptoms very sim-

ilar to anaphylatic shock, which in some instances was so severe that death resulted."

As to the chemical explanation, it appears that certain drugs can and do unite with the proteins in the body and through this chemical union a sensitivity to the drug is developed.

Certain sugar groups as well as the proteins may be involved in the production of hypersensitivity to a certain drug. For example, Dr. Quick pointed out that many drugs in the body unite with glucuronic acid, a derivative of glucose which is the carbohydrate of corn syrup. This glucuronic acid is found in the carbohydrate complexes of some of the types of the pneumonia germ and other bacteria.

Salicylic acid, component of headache remedies and one of the simplest drugs known to cause severe reactions in sensitive persons, combines with glucuronic acid and also is known to unite with body proteins.

"Thus all the conditions are fulfilled which are required to bring about hypersensitivity," Dr. Quick observed.

Science News Letter, September 23, 1933

PHYSICS

Cosmic Space Filled With High Energy Positrons

REACHES of "empty" cosmic space between the galaxies are not really empty. They are filled with high-energy positrons, positively charged building-blocks of matter. They remain there, suspended permanently in space, because there are no electrons, their negatively charged opposites, for them to mate with. In stars, planets and other ponderable masses of matter, positrons, electrons and the recently discovered chargeless neutrons are associated into atoms.

This vast, disperse population of positrons in the incalculable oceans of intergalactic space makes up an appreciable fraction of the total mass of the universe, P. M. S. Blackett, Lecturer in

Physics at King's College, Cambridge University, told the British Association for the Advancement of Science. Basing his estimates on the calculations of the Abbé G. Lemaitre of Louvain University, Mr. Blackett finds that the unattached positrons account for about a thousandth part of the whole material universe.

Lord Rutherford, director of the Cavendish Laboratory at Cambridge, in a special interview with a Science Service representative, confirmed the view that a positron-electron pair probably originate outside the atomic nucleus when a cosmic ray strikes an atom.

Science News Letter, September 23, 1933



BOTANY



No Trees in the Ocean

MOST water plants are little plants. Nothing corresponding to the trees on shore grows in either the sea or in freshwater bodies on land. The biggest water plants are the great kelps or seaweeds, various species of which grow in the cool waters that wash all the world's temperate and sub-polar coasts. But although some of these attain lengths of a couple of hundred feet, they are not to be compared with trees. Indeed, they are not even to be compared with the vines that drape the trees, for they are not even as strongly built as vines.

And these great seaweeds are outstanding exceptions among water plants. Other seaweeds can be counted as big ones if they reach a length of two or three feet; and the vast majority of sea plants, both in numbers and in total bulk, are microscopic in size. The same is true of freshwater plants: a few conspicuous things like water-lilies and mermaid-weed, but the great majority measurable in inches at best, and the bulk of them invisible to the naked eye.

Why this astonishing disparity in size between land plants and water plants?

To a considerable degree, the limits to size in water plants are imposed by the mechanics of the environment. It bothers a tree or big bush but little when the wind blows, at least when it blows anything short of a hurricane or tornado. Air is not a very massive sort of thing, and when it meets a stout stem it splits and flows around, without a too-vehement push or pull.

But water is many times as massive as air. Even when it flows in a moderate current it puts very considerable stress on any obstacle, and when it is pro-

voked into great waves or violent eddies it can tear apart or smash very stout structures. If the biggest big tree of California were rooted to the bottom off the California coast, it would not stay there through more than one or two winter storms. The first would strip it of every leaf, and the second or third would uproot it and dash its tough limbs to splinters on the rocks.

Good reason then for the humility of most water plants. They stay below the size that would enable the waves to tear them loose or rip them to pieces, and they keep their structure yielding, so that they go with the waves and currents, rather than stand stiffly against them, inviting destruction.

They are the meek. They have inherited the sea.

Science News Letter, September 23, 1933

GEOLOGY

Geologists Find Poetry in Rocks; Poets Write Geology

THERE ARE not only sermons in stones; there is poetry in them as well. So said Dr. R. S. Bassler, curator of geology at the U. S. National Museum, in an address given in Washington under the auspices of Science Service.

"Much of the poetry of nature which has endured has been written by students who have described their impressions with such care that they are scientifically correct, even though the underlying principles may not have been understood," said Dr. Bassler. "The geologist is seldom a poet and the poet rarely has an appreciation of geology, yet often they evidence a mutual understanding."

Poets who write about such subjects as the wind, the rain, and the dashing of waves against the shore, may not realize that they are really writing about geology, but they are. For the wind moves all the waters of the world, whether as vapor in the air that eventually falls as rain or snow, or as currents and waves in lakes and sea. And water, falling as rain, running as streams, freezing as ice, or dashing as waves, wears down even the "everlasting hills" and is the most potent of all the working tools of geological change.

Dr. Bassler's address was broadcast over the network of the Columbia Broadcasting System.

Science News Letter, September 23, 1933

PSYCHOLOGY

"Kick" of Movie Love Scenes Measured in 16-Year-Olds

MEASURING the emotional flutterings of adolescents as they viewed a glamorous love scene in the movies was part of a program of scientific research reported by Dr. Christian A. Ruckmick of the State University of Iowa to the American Psychological Association at its Chicago meeting.

Scenes of romance and amorous approach produce a far greater effect on the emotions of young people aged about sixteen than on either younger children or those who have attained the age of twenty-two. Younger children, under twelve, received the greatest "kick" from scenes of excitement and personal danger, Dr. Ruckmick found. The emotional excitement was measured in all cases with a galvanograph.

Re-showing of the same films brought out the fact that the vicarious thrill of watching scenes of danger is not so lasting as that from watching an amorous embrace. Although the excitement resulting from the original showing of the hair-raising episode was the greater, repeated showings resulted in a rapid decline of the emotional effect. The young people could sit through six re-showings of the love scenes, however, without appreciable decline of response by the adolescents.

The same experiment, tried on persons suffering from mental diseases, showed that this technique might prove very useful to physicians in revealing past disturbing experiences in the mental lives of the patients.

Does Your Heart "Skip a Beat"?

If you were startled by hearing the sudden noise of a pistol shot, would your heart jump a beat or behave in other irregular fashion?

It might, it seems from research reported to the same meeting by Dr. Carney Landis, of the New York Psychiatric Institute. The popular idea that the heart is intimately connected with emotional experiences, especially of a surprise nature, receives support from Dr. Landis' experiments.

Psychologists have so far failed to confirm this idea because they did not observe carefully enough the timing of the startling experience with relation

to the period in the cycle of the heart's action, Dr. Landis said. At certain points in this cycle, the heart does not respond; at others, the paths are open and irregularity of action is produced.

Dr. Landis startled his subjects by sudden yells, by the raucous blast of an automobile horn, by the loud report of a pistol shot, by the setting off of a photo-flash lamp, and by tapping on the head with a blackboard eraser. The action of the heart was recorded in electrocardiograms.

Science News Letter, September 23, 1933

Sign in Picture Writing Of Mayas Deciphered

SUCCESS in identifying one of the long-sought signs of the Mayan picture writing is reported by J. Eric Thompson of the Field Museum of Natural History, Chicago.

This hieroglyph, which can now be recognized in the reading of old stone monuments in Mayan cities, is the sign for fifteen Tuns, or approximately 15 years. Since the Mayas counted "by twenties," the numbers five, ten, fifteen, and twenty, were important and much used in their calculations.

"Glyphs representing five, ten, and twenty Tuns respectively have been identified but the glyph for fifteen Tuns, the remaining division in the vigesimal system, has heretofore eluded identification," said Mr. Thompson.

"The task of translating Maya inscriptions is extremely difficult, the greater part of the glyphs not yet having yielded their meanings. Indeed, in the past twenty years the number of glyphs translated could be counted on both hands."

The sign for fifteen Tuns, or years, devised by the Mayan Indians is not very different from the sign for twenty years. It is an oval decorated block standing on a pedestal.

Science News Letter, September 23, 1933

Buying a winter coat on a warm day now becomes a pleasure in one store that maintains cold weather temperature in a room where coats are tried on.

MEDICINE

Health Officer Said to Have Had Mild Encephalitis Case

THE FIRST case of encephalitis in one of the scientists fighting the epidemic in St. Louis appears to have been suffered by Dr. J. P. Leake, U. S. Public Health Service officer in charge of the investigations.

This attack was not incurred as a result of the experiment in which three of the scientists submitted to bites from mosquitoes that had previously fed on encephalitis patients. It is too early for results from this experiment planned to determine whether mosquitoes do carry the disease, as has been suspected from the fact that they transmit a similar disease of horses.

Dr. Leake himself pooh-poohs the idea that he had an attack, but his associates are convinced that he did. The attack occurred about a week ago while he was on his way to Washington, D. C., from St. Louis, Mo., to report on the situation to Surgeon-General Hugh S. Cumming. The attack was very mild, lasting about one day.

There have been many such attacks during this present epidemic. In fact, the men investigating the outbreak believe that there have been hundreds of such cases that have not been reported, simply because they were so mild that the sufferer did not realize himself that he had anything serious ailing him and failed to consult a physician. In these

cases, the attack consists of intense headache, nausea and vomiting. The patient feels very badly for several hours but by the end of a day has recovered.

This very mild type of case, among other things, has convinced the investigators that the disease which has been epidemic in St. Louis is not typical encephalitis as previously known and they are now calling it encephalitis B. Further indication that this is a new form of the disease is seen in the fact that there are absolutely no after-effects, which have been a serious feature of ordinary encephalitis. The patients who do not die in this epidemic recover entirely.

Names of the scientists who volunteered for encephalitis-infected mosquito bites have been withheld by the U. S. Public Health Service. This sort of service is considered merely part of the day's work by officers of the Service.

Meanwhile encouraging results are obtained from the efforts to establish the disease in monkeys. If this can be done the need for human guinea pigs will have been eliminated. Symptoms of the disease are now appearing in the second group of monkeys, inoculated with material from a group that developed the disease after inoculation from encephalitis patients.

Science News Letter, September 23, 1933

• First Glances

See Also
Page 208

Education

NURSERY SCHOOLS, THEIR DEVELOPMENT AND CURRENT PRACTICES IN THE UNITED STATES—Mary Dabney Davis and Rowena Hansen—*Government Printing Office*, 92 p., 15c. A bulletin of the Office of Education, U. S. Department of the Interior. Organization and administration of 203 nursery schools are presented in this illustrated report. Educators, parents and others interested in child hygiene will find interesting material here presented.

Science News Letter, September 23, 1933

National Parks

THE NATIONAL PARKS AND EMERGENCY CONSERVATION—Isabelle F. Story—*Govt. Print. Off.*, 32 p., free. Although issued primarily for the boys in the Civilian Conservation Corps, this pamphlet contains information and points of view which will make profitable reading for any person at all interested in the conservation and up-building of our great system of national parks and other areas devoted to recreation and education.

Science News Letter, September 23, 1933

Radio

SHORT WAVE BEGINNER'S BOOK—Hugo Gernsback—*Short Wave Craft*, 36 p., 25c.

Science News Letter, September 23, 1933

Radio

10 MOST POPULAR SHORT WAVE RECEIVERS: HOW TO MAKE AND WORK THEM—Various Authors—*Short Wave Craft*, 36 p., 25c.

Science News Letter, September 23, 1933

Radio

HOW TO BECOME AN AMATEUR RADIO OPERATOR—Myron F. Eddy—*Short Wave Craft*, 72 p., 50c.

Science News Letter, September 23, 1933

Holds your SNL in a grip of steel

Costs
50c
Post-
paid
in
U. S. A.

Here is a cover for your SCIENCE NEWS LETTER that is no bother at all! No holes to punch, no screws to tighten. Just snap it open, lay in your latest SCIENCE NEWS LETTER on top of the older ones, snap it closed. Two strong fingers of steel hold the copies firmly. Capacity, four months' issues. Cover color, black. Cover material, leather finished heavy bookbinder's bristol. Cost 50c, postpaid anywhere in U. S. A. \$1 elsewhere. Cash in advance. Send order and remittance to Librarian, SCIENCE NEWS LETTER, 21st and Constitution Avenue, Washington, D. C.

Just Published

THE MAKING OF GEOGRAPHY

By R. E. DICKINSON
and O. J. R. HOWARTH

The story of the progress of geographical science from the days of Sumerian and Egyptian mysteries and the classical conceptions of the Greeks, through the religious imaginations of the mediaeval cartographers, down to the most modern developments of our day. With illustrations of famous maps, early instruments, etc. \$5.00.

OXFORD UNIVERSITY PRESS
114 Fifth Avenue New York

• First Glances at New Books

Anthropology

FOSSIL MAN IN CHINA—Davidson Black, Teilhard de Chardin, C. C. Young and W. C. Pei—*Geological Survey of China and National Academy of Peiping*, 164 p., 6 folded maps. Everything connected with the finds of *Sinanthropus* and associated artifacts and fossils at Choukoutien is here discussed by the scientists who have been most active in connection with the discovery and description of this most important recent discovery of ancient man. The body of the text is in English, with a brief appended summary in Chinese.

Science News Letter, September 23, 1933

Library Science

A MANUAL OF CATALOGUING AND INDEX—J. Henry Quinn and H. W. Acomb—*Scribner's*, 286 p., \$3. The jacket says: "Cataloguing codes and rules are here adapted and applied to the styles of catalogues most serviceable for Municipal, Collegiate, County and School Libraries, and examples are worked out fully to demonstrate the rules. Indexing is specially treated, and the theory is similarly illustrated by example. The *Manual* will therefore be found useful for reference by cataloguers and indexers, and as a text-book for students of librarianship." This book constitutes vol. No. 5, of the Library Association Series of Library Manuals.

Science News Letter, September 23, 1933

Photography

MODERN PHOTOGRAPHY: 1933-34—Edited by C. G. Holme—*Studio Publications, Inc.*, 128 p., cl. \$4.50, pa., \$3.50. From all the lands of the world, picturing a wide range of subjects in as wide a range of photographic techniques, many skilled artists have contributed their best to make this new annual outstandingly beautiful.

Science News Letter, September 23, 1933

Entomology

INSECT BEHAVIOUR—Evelyn Cheesman—*Ballou*, 189 p., \$1.50. Interesting and well-written observations on the ways of insects, recorded in many corners of the world by a wide-ranging British naturalist.

Science News Letter, September 23, 1933

Education

REPORT OF THE NATIONAL CONFERENCE ON THE FINANCING OF EDUCATION—*National Education Association*,

78 p., 25c. The findings and recommendations of this Conference are of interest far beyond the circle of teachers, superintendents and other professional educators who furnished its original incentive. Taxing authorities, as well as patrons and administrators of private educational institutions, tempted in the present stringency to "economies" that may go to harmful extremes, should at least acquaint themselves with the facts presented here before they swing the ax.

Science News Letter, September 23, 1933

Radio

OFFICIAL SHORT WAVE LOG AND CALL BOOK—Hugo Gernsback, Editor—*Popular Book Corporation*, New York, 25c per issue. The first issue (August) of a new quarterly designed to appeal to the army of enthusiasts working in the short-wave radio field.

Science News Letter, September 23, 1933

Biology

THE LIVING WORLD—Helen Gardner Mank—*Sanborn*, xxiv+673 p., \$1.68. A general biology for high school courses.

Science News Letter, September 23, 1933

Biology

MAN INTO WOMAN—Edited by Niels Hoyer—Translated from the German by H. J. Stenning—*E. P. Dutton*, 288 p., \$3.50. This book with an introduction by an English specialist on sex cases, Dr. Norman Haire, is said to be an authentic record of a change of sex. Although conceivably true, the story seems more like fiction than fact. Many well-known cases of human hermaphroditism, the condition which afflicts the hero of this book, have of course, been reported in the medical literature. Unusual and daring surgical operations, of the type described in the book, are likewise frequently reported by European surgeons. Scientifically, however, the book appears to have little or no value. Its entertainment value is a matter of individual taste, but will probably rate high with a large group of "modern" readers.

Science News Letter, September 23, 1933

General Science

BUSINESS AND SCIENCE—Edited by R. J. Mackay—*Sylvan Press*, London, 311 p., 5s. A collection of papers by industrial scientists and business men on such subjects as management research, business forecasting, the human body at work, personnel selection, patent law reform, etc., delivered at the Centenary Meeting of the British Association for the Advancement of Science, London, 1931.

Science News Letter, September 23, 1933

Chemistry

CHEMICAL REFINING OF PETROLEUM—V. A. Kalichevsky and B. A. Stagner—*Chemical Catalog Co.*, 451 p., \$7. Oil refining used to be a relatively simple problem in the physics of fractional distillation; now, however, with the ever-thirsty tanks of motor vehicles incessantly clamoring for more, refiners have to face the job of making big molecules into little ones, and that involves some very earnest chemistry. This new and very comprehensive reference book tells how it is done and chemically why. It is a most useful addition to the series of American Chemical Society Monographs.

Science News Letter, September 23, 1933

Chemistry

ALLEN'S COMMERCIAL ORGANIC ANALYSIS, VOL. X—Edited by C. Ainsworth Mitchell—*Blakiston*, 817 p., \$7.50. This volume treats of haemoglobin and its derivatives, albuminoids or scleroproteins, structural proteins, examination of foodstuffs for vitamins, the hormones, the identification of unknown woods and charcoals, and the pectic substances. Fifth edition.

Science News Letter, September 23, 1933

Invention

VALUABLE HINTS TO INVENTORS—A. F. Gillet—*Inventors Publ. Co.*, Washington, D. C., 94 p., \$1. How to invent, what to invent, how to go about getting your invention patented, how to make a patented invention pay, are among the subjects discussed in this compact little book.

Science News Letter, September 23, 1933

Science News Letter will secure for its subscribers any book or magazine in print which was published in the United States. Send check or money order to cover regular retail price (\$5 if price is unknown, change to be remitted) and we will pay postage in the U. S. When publications are free, send 10c for handling. Address: Book Dept., Science News Letter, 21st and Constitution Ave., Washington, D. C.